




PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application of:	)	<b><u>CERTIFICATE OF MAILING</u></b>
	)	I hereby certify that this correspondence is
STRUCKMEIER ET AL.	)	being deposited with the United States
	)	Postal Service as first class mail in an
Serial No.: 10/006,090	)	envelope addressed to: Mail Stop-Box
	)	Amendment - No Fee, Commissioner for
Filed: December 6, 2001	)	Patents, P.O. Box 1450, Alexandria, VA
	)	22231-1450 on <u>November 22, 2004</u> .
Examiner: Thomas Noland	)	
	)	
Art Unit: 2881	)	<u>Thomas P. Vita, Jr.</u>
	)	
MANUAL CONTROL WITH	)	
FORCE-FEEDBACK FOR PROBE	)	<u>11/22/04</u>
MICROSCOPY-BASED FORCE	)	Signature Date
SPECTROSCOPY	)	
ASSEMBLY	)	

**DECLARATION OF DOUG GOTTHARD UNDER 37 C.F.R. §1.131**

I, Doug Gotthard, declare as follows:

1. I, along with Mr. Ben Ohler and Mr. Jens Struckmeier (collectively "the inventors"), am an inventor of the subject matter of the above-captioned patent application.
2. I have reviewed the Office Action dated June 21, 2004, in the above-captioned patent application and the reference cited therein, namely, Proksch et al., U.S. Publication No. 2004/0000189 (hereinafter the "Proksch et al. publication").
3. I, together with the other inventors, conceived and reduced to practice the Manual Control With Force-Feedback For Probe Microscopy-Based Force Spectroscopy system described and claimed in the above-identified application prior to the effective filing date of November 5, 2001, of the Proksch et al. publication (provisional application filing date).

4. On information and belief, Exhibit A is a true and correct copy of e-mail correspondence concerning the claimed invention, communicated between at least the inventors prior to the effective filing date of the *Proksch et al.* publication.

5. On information and belief, Exhibit B is a true and correct copy of engineering notebook pages prepared by me in developing the claimed invention, including the components listed in the e-mail correspondence of Exhibit A. These pages were produced prior to the effective filing date of the *Proksch et al.* publication, November 5, 2001.

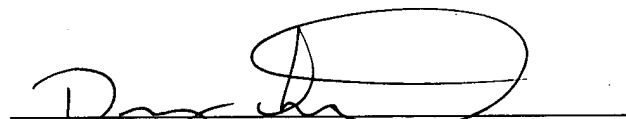
6. Exhibits A and B illustrate the claimed features of the present invention, namely, in Exhibit A, the “knob” and “brake” listed in Mr. Ohler’s e-mails, and in Exhibit B, the “knob” and “brake” shown in my engineering notebook pages, illustrate the claimed components (for instance, “manual input device” and “passive resistance device”, respectively).

7. On at least information and belief, at all times at least one year prior to the filing date of the above-identified application, Exhibits A and B remained confidential to Veeco employees, including the inventors of the invention of the above-identified patent application.

U.S. Serial No.: 10/006,090  
Group Art Unit: 2881  
Inventor: Struckmeier et al.  
Page 3

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code; and that willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: 11/19/2004

  
Doug Gotthard

- - Date Redacted - -

Ben Ohler

From: Ben Ohler  
Sent: Doug Gotthard  
To: connections for knob  
Subject:



Power: +/- 15V and +/- 5V (5v for electronics and 15V for brake and adding/subtracting from low V Z)

Inputs: Low V Z  
Deflection

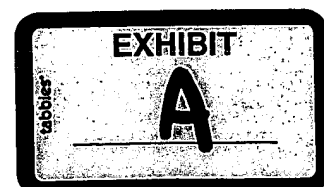
Outputs: The new low voltage Z (The standard low V Z can be jumpered to this before the knob is in place)

Trigger inputs (through serial?): Set knob feedback force to zero (user sets when to do this in software)  
Reset knob voltage offset to zero (user sets in software)

If the triggers through the serial port are too hard to implement we can always use buttons on the knob box.

I have a general scheme sketched out but it will take someone with more electronics knowledge than me to implement.

-Ben



- - Date Redacted - -

**Ben Ohler**

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**From:** Ben Ohler  
**Sent:**  
**To:** Doug Gotthard; Jens Struckmeier; Bernd Maringer; Ben Ohler  
**Subject:** Knob info on Zone

I have selected an enclosure, brake, and two possible encoders for the knob.

PDF spec sheets are on zone under "knob"

Bernd: The spec sheets for the encoder decoder chips are in the "encoder" folder off the main "knob" folder.

- - Date Redacted - -

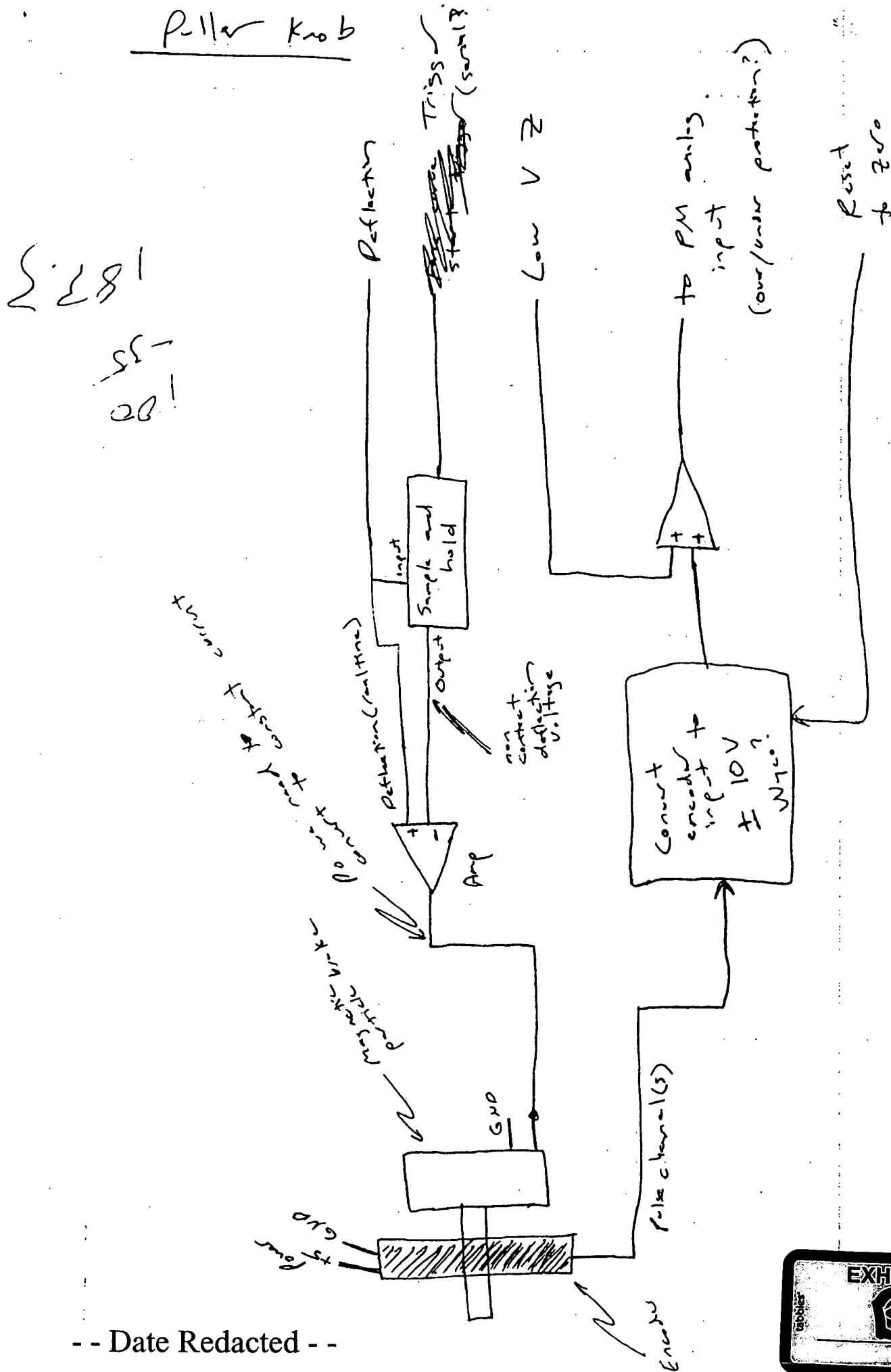
**Ben Ohler**

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**From:** Ben Ohler  
**Sent:**  
**To:** Bernd Maringer; Doug Gotthard; Jens Struckmeier  
**Subject:** FYI: knob parts delivery

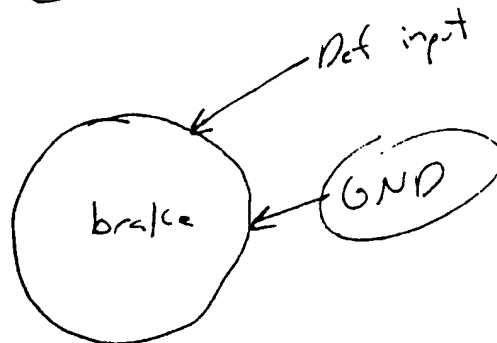
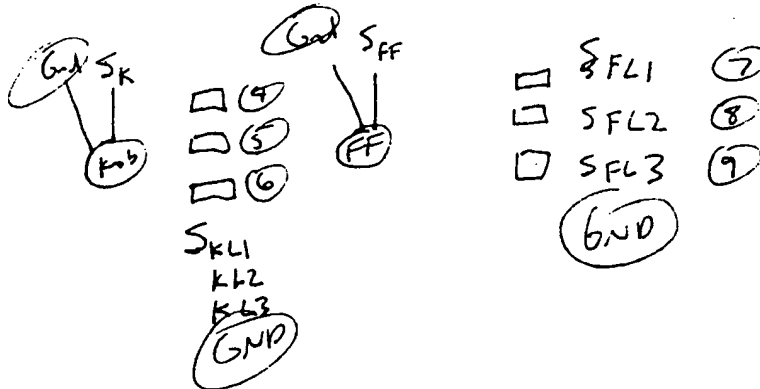
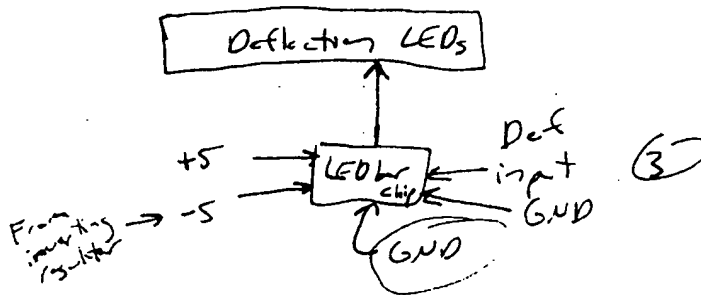
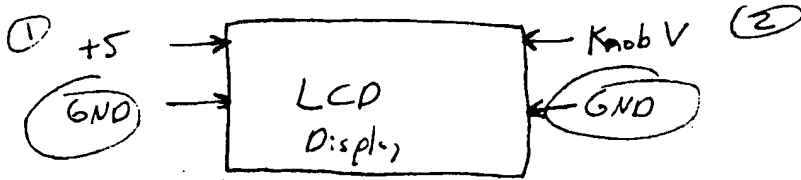
Enclosures (Nova 63 & Nova 127): Wednesday  
Encoder (E4): Thursday  
Encoder chip (LS7084): Thursday  
Knob: Thursday  
6V Brake: Thursday or Friday

- - Date Redacted - -

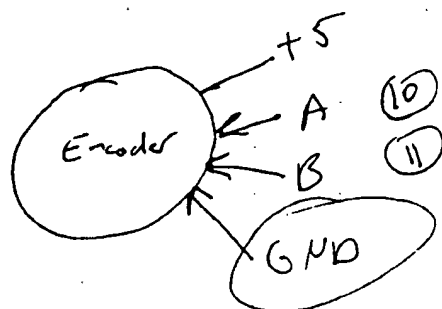


# Knob box Required Lines

Sorting out signal routing for knob indicators, encoder & brake



11 lines before GND



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<u>Sens</u>	<u>min V</u>	<u>Max V</u>	<u>PK-PK</u>	<u>Ramp</u>	<u>Non Lin</u>
1315	4.48	5.56	1.08	1.42 $\mu$ m	0.2
1388	3.98	6.04	2.06	2.86	0.15
1.41	3.52	6.52	3.02	4.26-7	0.15-0.25
1.38	2.96	7.08	4.12	5.7	0.25-0.3
1.4	2.48	7.56	5.08	7.12	0.3-0.35
1.39	1.96	8.08	6.12	8.54	0.35-0.4
	1.52	8.72	7.20	9.95	0.45-0.5
	0.960	9.20	8.24	11.37	0.5-0.6
	0.48	9.68	9.2	12.79	0.6-0.7
	0.08	10.1	10	13.94	0.65-0.7

$$73.2 = \frac{1339 \text{ nm}}{V} \cdot \frac{1V}{18.3V} = \underline{\underline{73.2}}$$

PI  
 controller  
 (desktop)  
 - Closed Loop  
 - XY piezo tube  
 (thru)  
 - Z piezo not  
 tracer

LowV	HighV	DeltaV	Ramp Size (um)	Non-lin (%) (+/- 0.1)	Sens (nm/V)
4.48	5.56	1.08	1.42		
3.98	6.04	2.06	2.86	0.15	1314.81481
3.5	6.52	3.02	4.26	0.15	1388.34951
2.96	7.08	4.12	5.7	0.2	1410.59603
2.48	7.56	5.08	7.12	0.28	1383.49515
1.96	8.08	6.12	8.54	0.35	1401.5748
1.52	8.72	7.2	9.95	0.4	1395.42484
0.96	9.2	8.24	11.37	0.5	1381.94444
0.48	9.68	9.2	12.79	0.55	1379.85437
0.08	10.1	10.02	13.94	0.65	1390.21739
				0.7	1391.21756